nature is necessarily fairly heavy reading. It is highly recommended to those who wish to keep up to date with modern developments in communications technology. It is not full of mathematical statistics of the theory of models but has a very practical approach to achieving the objective of creating efficient and effective networks.

Part 1 on Protocols deals with the logical and physical structure of interlocutors passing messages and commands up and down and sideways in a system of hierarchial levels. Eight techniques are applied to the specification and analysis of protocols. After a review paper on the art of Simulation, which gives sources for following up the topic, Part 2 discusses applications to network design, to packet switching, to protocol layers, to the X 21 interface—which revealed possible deadlocks, to flow control in very large networks with two hierarchial levels, to provide quantitative results for telephone networks, and to procurement and acceptance testing of large computer systems for the UK Government. Part 3 describes systems for electronic mail, Delphi techniques, word processing, graphics, and modelling or gaming. These are discussed as elements within conferencing facilities, OSI and international networks. An index to the topics covered would have been a valuable addition to a very useful text.

PHILIP GILES
Stirling

MARIJA J. NORUSIS
SPSS Introductory Guide
McGraw-Hill, Maidenhead, Berks, 1982.
173 pp. £8.75.

SPSS (The Statistical Package for the Social Sciences) is the most widely available set of computer programs for the statistical analysis of data in the world. It is in use in nearly all University Computer Centres, not only in the UK but in very many other countries. It has a manual which is a somewhat forbidding prospect for the new user. This book is exactly what its title suggests and is a very good and readable introduction to statistical computing with SPSS. It is very dependent on version 9 of SPSS being available, and while it uses the package SPSS GRAPHICS for illustration it does not give any guide to its use. It gives a clear discussion of the techniques of statistics used, from elementary descriptive statistics to multiple linear regression. Each chapter has a different example of real data with interesting titles such as 'Selling canary crunch to Junior', 'Skirts and Beards'. The topics covered include all the most frequently needed analyses with discussion not only of the methodology and means of obtaining a given output, but also clear description of the interpretation of the output and the important assumptions made.

SPSS is now a much more reliable package in terms of the numerical accuracy of its algorithms than it used to be although there is still room for improvement. This guide will not only serve as an introduction to the package, it could be used for courses in

statistics which are oriented to the use of SPSS (some exercises are given in an appendix). A summary of frequently used commands is given which will be of aid to the more experienced SPSS user.

S. EVANS
London

M. J. D. POWELL (EDITOR)
Nonlinear Optimization 1981
Academic Press, London, 1982. 559 pp.
£21.20.

In July 1981 an 'Advanced Research Institute' was held in Cambridge, UK, on Nonlinear Programming, to consider the state of development of the subject, to offer opinions on future directions of research, and to publish findings.

Altogether 61 selected participants from 15 countries attended. Seven discussion meetings were held, on Constrained Optimization, Nonlinear Fitting, Linear Constraints, Nonlinear Constraints, Large Nonlinear Problems, The current state of Software, Future Software and Testing. Each consisted of four or five invited papers, followed by discussions.

The invited contributions are here reproduced, along with the discussions. There were also research seminar talks, but only their titles are listed in this volume.

It is in the nature of such gatherings that only those familiar with the subject and its recent developments—i.e. the participants themselves, and their peers—can profit from what is offered. For these the publication is of value, though much of the contents is available in earlier papers. The reproduction of questions and answers in the discussions is only of transient significance.

Your reviewer profited most, in fact, from the list of about 500 references.

S. VAJDA
Sussex

K. G. NICHOLS AND E. J. ZALUSKA
Theory and Practice of Microprocessor
Edward Arnold, London, 1982. 297 pp. £20.00, £9.50 Paper.

This book is about the design and development of digital electronic equipment employing microprocessors. It aims to provide a reader who has little previous experience of computers or digital electronics with a good knowledge of the design of microprocessor based systems. Although it gives some information on programming principles, the book is in no way intended to provide a course in software engineering. The text is thorough and detailed and while not recommended for light reading will, with perseverance, yield a considerable volume of information. The diagrams also deserve careful study to yield maximum information. The greatest benefit will probably be realized by studying the book in conjunction with a real project or a course of practical work. In this respect it would be most suitable

as part of an undergraduate course in microprocessor systems design.

The first two chapters which are devoted to computer fundamentals and system components and their implementation, are aimed primarily at the reader with little previous knowledge. The basic ideas and concepts thus established are built upon through the remainder of the book. Two further chapters are devoted to microprocessor architecture, programming and languages. The book then covers the practical subject of development equipment and explains the different types of hardware and software development systems currently available. The remainder of the work includes details of currently available microprocessor types and systems including 8 bit, 16 bit, bit slice and single chip devices.

In short this is a worthwhile book cramming a large amount of detailed information between its covers. It should be useful both as a course in microprocessor system design and as a reference book for microprocessor engineers.

M. HORWOOD
Exeter

ARNOLD VANDOREN
Data Acquisition Systems
Prentice-Hall International, Hemel Hempstead, 1983. 289 pp. £16.45.

In a book of 289 pages covering such topics as sampling theory; signal quantization and recovery; multiplexing; signal conditioning; D to A and A to D converters; plus the errors associated with each of these topics, and two chapters on microprocessors and associated peripheral devices, the author has necessarily had to restrict his coverage of each topic severely.

In most cases this has been successfully accomplished without too much loss of detail. However in certain cases the compression has been taken too far. Convolution is dealt with so briefly that the uninitiated would remain so, and in the section on Fourier analysis and transforms, Laplace transforms are not even mentioned. However the subsequent section dealing with Sampling theory, Aliasing and signal recovery together with the errors involved in these processes are clearly explained.

Operational amplifiers are almost exclusively dealt with as low frequency voltage amplifiers and the instability problems associated with internal phase shifts are hardly mentioned. The section on A to D and D to A converters contains much useful information on the variety of hardware and techniques presently available, and the last two chapters are an excellent introduction to the microprocessor, its instruction set, addressing modes and data storage and retrieval.

As a book associated with a specific lecture course, the author's students would find this excellent reading material, but read on its own it tends to be a little too concise.

J. A. BOWLES
Dorking